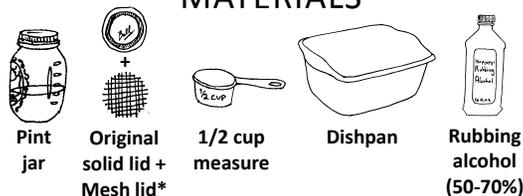


SAMPLE REGULARLY (EVERY MONTH!)

Alcohol wash

The most accurate way to determine *Varroa* levels in your hives

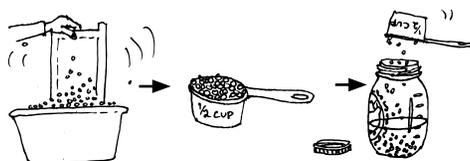
MATERIALS



*1/8 inch hardware cloth, cut to match solid lid

10 STEPS

- 1) Pour alcohol into jar. Set materials in easy reach
- 2) Find a frame of **open brood**
Check that the queen is not on frame!
- 3) **Shake adult bees from frame into dishpan**
Scoop 1/2 cup (~300) bees and pour into jar



- 4) Shake remaining bees from bin into colony
- 5) Seal solid lid on jar and **shake for 1-2 min**
- 6) Let jar sit for 1-2 minutes
- 7) Replace solid lid with mesh lid
- 8) **Shake jar contents into empty dishpan**
- 9) **Count the total # mites.**
If there are >3, it is time to apply a chemical treatment
(see inside of brochure)



- 10) Discard bees and mites
Wash all materials; can reuse alcohol

→ email bees@mass.gov for a free kit!

KNOW YOUR PEST

Meet the *Varroa* mite...

The Varroa Mite, *Varroa destructor*, is an external parasite that feeds on honey bee adults and brood. **They weaken bees and transmit viruses.**



Unmonitored and unmanaged infestations of Varroa mites will result in colony death.

COMMON SIGNS OF MITE DAMAGE:



- Open or damaged pupal cells
- Chewed-down pupae
- Emerging adult bees with deformed or missing wings

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Drawings by Hannah Whitehead. Brood photo by Kim Skyrn. Other images from USDA Office of Communication in Research Science <https://www.usda.gov/media/blog/2014/05/13/helping-honey-bees-health>



United States Department of Agriculture National Institute of Food and Agriculture



Integrated Pest Management (IPM) for *Varroa* mites



IPM is a decades-old farm strategy for mitigating pests while minimizing chemical use. Experts now recommend IPM for *Varroa*.

Rather than relying on a "silver bullet", good IPM incorporates **multiple practices** throughout the season, based on **pest levels** and **pest biology**.

IPM PRINCIPLES:

- **KNOW YOUR PEST**
- **PREVENT** pest build up using non-chemical practices
- **SAMPLE REGULARLY** to track pest population levels
- **INTERVENE** with pesticides when populations reach damaging thresholds
(vary products to prevent pest resistance)



This pamphlet will help you to use IPM principles to manage *Varroa* mites.

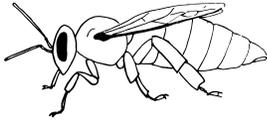


PREVENT PEST BUILD UP USING NON-CHEMICAL PRACTICES

SPRING AND SUMMER

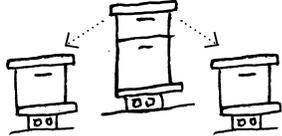
Re-Queen

Select mite resistant stock when available



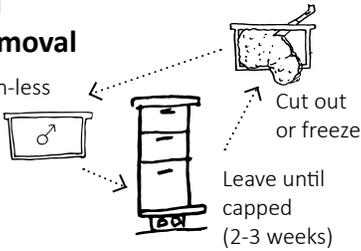
Brood Interruption

Split hive or allow to swarm (capture swarm!)



Drone Brood Trapping/Removal

Insert foundation-less or drone frame

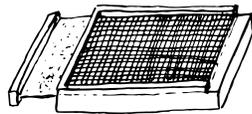


Leave until capped (2-3 weeks)

ALL YEAR

Screened Bottom Board

Check mite drop for effectiveness



CHEMICAL TYPES:

Synthetic

PROS: Targeted toxicity
CONS: Last longer in the environment

Organic

PROS: Degrade quickly
CONS: Broad-spectrum toxicity (more harmful to the beekeeper!)

PERSONAL PROTECTIVE EQUIPMENT (PPE):



Chemical-resistant gloves



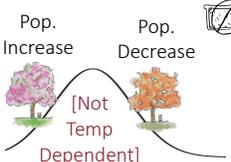
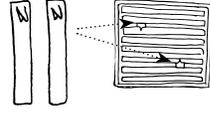
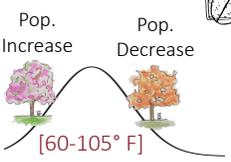
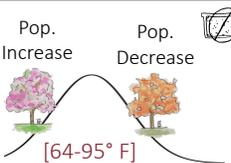
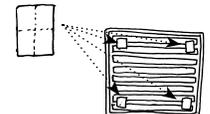
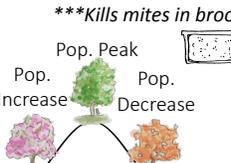
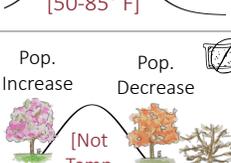
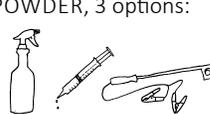
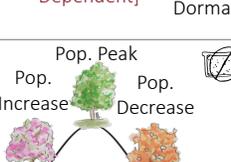
Safety goggles



Respirator with an organic particulate filter

INTERVENE W/ PESTICIDES WHEN PESTS EXCEED THRESHOLDS (>3 MITES/SAMPLE!)

TABLE OF MITICIDE OPTIONS for full product labels, visit <http://www.kellysolutions.com/MA/pesticideindex.htm>

	Name Active Ingredient [mode of action]	Season [temp]  = less effective when brood is present	Honey super safe?	Treatment Duration	Application Type For instructional videos: honeybeehealthcoalition.org/varroa	Personal Protective Equipment
Synthetic	Apivar® amitraz [contact]	Pop. Increase Pop. Decrease  [Not Temp Dependent]	NO 	6-8 weeks  wait 2 weeks to add honey supers	PLASTIC STRIP 	 <i>Miticides can harm people too!! Protect yourself with proper PPE</i>
	ApiGuard® thymol [fumigant]	Pop. Increase Pop. Decrease  [60-105° F]	NO 	4-6 weeks  Can add honey supers immediately after	GEL OR GEL TRAY 	
Organic: essential oil	Api Life Var® thymol, menthol, eucalyptus oil [fumigant]	Pop. Increase Pop. Decrease  [64-95° F]	NO 	26-32 days  wait 1 month to add honey supers	FOAM WAFER 	
	MAQS®, Formic Pro® formic acid [fumigant]	***Kills mites in brood Pop. Increase Pop. Peak Pop. Decrease  [50-85° F]	YES 	MAQS: 1-3 weeks Formic Pro: 2-3 weeks 	GEL STRIP 	 Recommended (but not required)
Organic: organic acid	Oxalic Acid, Api-Bioxal® oxalic acid dihydrate [contact, fumigant]	Pop. Increase Pop. Decrease  [Not Temp Dependent] Dormant	NO 	Immediate (but may need to repeat) wait 2 weeks to add honey supers	POWDER, 3 options:  Spray (liquid) Dribble (liquid) Fumigation (vapor)	
	HopGuard II/III® potassium salt of hops beta acids [contact]	Pop. Increase Pop. Peak Pop. Decrease  [50-85° F]	YES 	1 month 	CARDBOARD STRIP 	